WHAT IS CLAIMED IS:

1. A fluid control and processing system comprising:

a plurality of chambers;

a body including a fluid sample processing region; and

a plurality of valves, each valve including a valve body having a fluid displacement region which is depressurizable to draw fluid into the fluid displacement region and pressurizable to expel fluid from the fluid displacement region, the valve body including an external port, the fluid displacement region being fluidicly coupled with the external port of the valve body, the valve body being adjustable with respect to the fluid sample processing region to place the external port selectively in fluidic communication with the fluid sample processing region, and the valve body being adjustable with respect to the plurality of chambers to allow the external port to be placed selectively in fluidic communication with the plurality of chambers.

2. The system of claim 1 wherein the valve bodies of the valves are separately adjustable to place the external ports of the valve bodies selectively in fluidic communication with the fluid sample processing region or with the chambers.

3. The system of claim 1 further comprising a channel having two ends and disposed between the valve bodies of two valves, wherein the valve bodies of the two valves are adjustable with respect to the channel to place the two fluid displacement regions of the two valve bodies selectively in fluidic communication with the two ends of the channel.

4. The system of claim 3 wherein pressurization and depressurization of the fluid displacement region of one of the two valve bodies is synchronized, respectively, with depressurization and pressurization of the fluid displacement region of the other of the two valve bodies to move a fluid back or forth between the two fluid displacement regions via the channel.

5. The system of claim 1 wherein two valves are adjustable together by a single adjustment unit to place the fluid displacement regions of the two valve bodies simultaneously in fluidic communication with the fluid sample processing region in one position and to isolate the fluid displacement regions of the two valve bodies from the fluid sample processing region in another position.

6. The system of claim 1 wherein the external port of at least one of the valve bodies is disposed on one external port surface of the valve body.

7. The system of claim 6 wherein the external port surface is generally conical with respect to an axis.

8. The system of claim 7 wherein the valve body is rotatable around the axis of the external port surface and relative to the plurality of chambers to allow the external port to be placed selectively in fluidic communication with the plurality of chambers, the external port being spaced from the axis by a radius.

9. The system of claim 8 wherein the valve body is rotatable around the axis of the external port surface to allow the external port spaced from the axis by the radius to be placed selectively in fluidic communication with the fluid sample processing region.

10. The system of claim 8 further comprising a channel having two ends and disposed between the valve bodies of two valves, wherein the valve bodies of the two valves are adjustable with respect to the channel to allow the external ports of the two valves spaced from the axis to be placed selectively in fluidic communication with the two ends of the channel.

11. The system of claim 1 wherein the fluid displacement region is depressurizable by increasing in volume and is pressurizable by decreasing in volume.

12. The system of claim 11 further comprising a fluid displacement member disposed in the fluid displacement region, the fluid displacement member being movable to adjust the volume of the fluid displacement region.

13. The system of claim 12 wherein the fluid displacement member comprises a piston movable in a linear direction in the fluid displacement region.

14. The system of claim 1 wherein the fluid sample processing region comprises an active member selected from the group consisting of a microfluidic chip, a solid phase material, a filter, a filter stack, an affinity matrix, a magnetic separation matrix, a size exclusion column, and a capillary tube.

15. The system of claim 1 wherein the body including the fluid sample processing region is formed in one of the valves with the fluid sample processing region in continuous fluidic communication with the fluid displacement region of the one valve.

16. The system of claim 15 further comprising a second fluid sample processing region, and wherein the plurality of valves are adjustable with respect to the second fluid sample processing region to place the external port selectively in fluidic communication with the second fluid sample processing region.

17. The system of claim 16 wherein the valve with the fluid displacement region in continuous fluidic communication with the fluid sample processing region includes a plurality of external ports which are selectively placed in fluidic communication with the second fluid sample processing region and the plurality of chambers.

18. A fluid control and processing system for controlling fluid flow among a plurality of chambers, the system comprising:

a body including a fluid sample processing region; and

a plurality of valves, each valve including a valve body having a fluid displacement region which is depressurizable to draw fluid into the fluid displacement region and pressurizable to expel fluid from the fluid displacement region, the valve body including an external port, the fluid displacement region being fluidicly coupled with the external port of the valve body, the valve body being adjustable with respect to the fluid sample processing region to place the external port selectively in fluidic communication with the fluid sample processing region, and the valve body being adjustable with respect to the plurality of chambers to allow the external port to be placed selectively in fluidic communication with the plurality of chambers.

19. The system of claim 18 wherein two valves are adjustable together by a single adjustment unit to place the fluid displacement regions of the two valve bodies simultaneously in fluidic communication with the fluid sample processing region in one position and to isolate the fluid displacement regions of the two valve bodies from the fluid sample processing region in another position.

20. The system of claim 18 wherein the valve bodies of the valves are separately adjustable to place the external ports of the valve bodies selectively in fluidic

communication with the fluid sample processing region or with the chambers, and wherein the fluid displacement regions of the valves are separately pressurizable and depressurizable.

21. The system of claim 18 wherein the valve body of each valve is rotatably adjustable around an axis and relative to the fluid sample processing region and the plurality of chambers to place the external port selectively in fluidic communication with the fluid sample processing region or with the plurality of chambers.

22. A method for controlling fluid flow between a plurality of valves and a plurality of chambers and a fluid processing region, each valve including an external port and a fluid displacement region fluidicly coupled with the external port, the method comprising:

adjusting the valves with respect to the plurality of chambers and the fluid processing region to place the external ports of the valves selectively in fluidic communication with the plurality of chambers and the fluid processing region.

23. The method of claim 22 wherein each valve is adjustable to close the external port so that the valve is fluidicly isolated from the chambers and the fluid processing region.

24. The method of claim 22 wherein one valve is adjusted to place the external port in fluidic communication with one chamber, and further comprising depressurizing the fluid displacement region of the valve to aspirate fluid from the chamber into the valve.

25. The method of claim 22 wherein one valve is adjusted to place the external port in fluidic communication with one chamber, and further comprising pressurizing the fluid displacement region of the valve to expel fluid from the valve into the chamber.

26. The method of claim 22 further comprising applying a magnetic field to the fluid processing region.

27. The method of claim 22 wherein the valve body of the valve is rotatable around an axis and relative to the fluid processing region and the plurality of chambers to allow the external port of the valve to be placed selectively in fluidic communication with the fluid processing region and the plurality of chambers.

28. The method of claim 22 wherein the valve bodies of two valves are adjusted to place the external ports of the two valves in fluidic communication with the fluid processing region, and further comprising synchronizing pressurization and depressurization of the fluid displacement region of one of the two valve bodies, respectively, with depressurization and pressurization of the fluid displacement region of the other of the two valve bodies to move a fluid back or forth between the two fluid displacement regions through the fluid processing region.

29. The method of claim 22 further comprising adjusting the valve bodies of two valves to place the external ports of the two valve in fluidic communication with two ends of a channel, and further comprising synchronizing pressurization and depressurization of the fluid displacement region of one of the two valve bodies, respectively, with depressurization and pressurization of the fluid displacement region of the other of the two valve bodies to move a fluid back and forth between the two fluid displacement regions through the channel.

30. The method of claim 22 wherein two valves are adjustable together by a single adjustment unit to place the fluid displacement regions of the two valve bodies simultaneously in fluidic communication with the fluid sample processing region in one position and to isolate the fluid displacement regions of the two valve bodies from the fluid sample processing region in another position.